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ABSTRACTS
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Studies on the Chemical Constituents of "Inekoji." Part VIII.

On the Margaric Acid Ester of Arabit (I).

(pp. 307～310)

By Teijiro YABUTA, Yusuke SUMIKI and Kinjiro TAMARI.

(Tokyo Imperial University; Received May 5, 1941.)

Abbau von Aminosäuren durch Asp. Oryzae.

IV Mitteilung.

(SS. 311～314)

Von Teijiro UYEMURA.

(Wissenschaftl. Laboratorium von Ch. Takeda & Co. ltd., Osaka;
Eingegangen am. 28. 4. 1941.)

On the Preparation of Methylethylketone and Isobutylaldehyde from 2,3-Butyleneglycol.

(pp. 315～320)

By Shinzaburo FURUHASHI and Kisetsu ŌHARA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received April 14, 1941.)

Studies on the Root Forming Substances of Cnttings.

(pp. 321～335)

By Kinjiro TAMARI.

(Agr. Chem. Laboratory, Tokyo Imperial University; Received April 23, 1941.)

On the Fixation of Sericin of Raw Silk. (Part VI).

One Method of Denoting the Degrees of Fixation of Sericin.

(pp. 336～340)

By Masami OKU.

(From the Fibre Chemical Laboratory, Ueda Imperial College of Sericulture and Silk Industry; Received April 12, 1941.)

There have been proposed many methods of determining the fixation-degrees of sericin of raw silk but none of these reveal the truth.

The most popular method hitherto adopted is to determine the loss of weight of sericin-fixed sample when subjected to scouring with some dilute alkaline solutions. But this method cannot be said to be adequate because this does not take into account the following items;

1) Differences between the methods of fixation.
2) 〃 〃 the temperature of determining the boiling-off.
3) Differences between the sericin contents of the sample.
4) 〃 〃 the purposes utilised under many dyeing and finishing operations.

The author proposes here one method of denoting the adequate fixation degrees of raw silk, as follows.

When we take,

$A\%$ = Total loss of weight on scouring off the sericin-fixed sample,
$B\%$ = Solubility of the sericin-fixed sample,
$F\%$ = Fixation-degrees of sericin,

then

$$F\% = \frac{A-B}{A} \times 100.$$

Studies on the Chemical Sterilization and Preservation on Fishes and Shellfishs. II～III.

(pp. 341～360)

By Sogo TETSUMOTO.

(Government Institute for Infections Diseases, Tokyo Imper. Univ.; (Received Nev. 8, 1940.)

On the Oxidizing Enzymes in Tea Leaf. I.

(pp. 361～369)

By Hideiti TORII.

(Imperial Tea Experiment Station; Received March 19, 1941.)

1. The author describes the method of estimating peroxidase and catechin oxidase in tea leaf.

2. The properties of these enzymes, such as opt. pH, reaction temperature, thermostability and influence of light are reported.

3. The enzyme content of green leaf under some conditions and its variations in tea manufacture are studied.

On the Fixation of Silk-Sericin with Formaldehyde.

Part 2. The Adsorption of Formaldehyde on Various Kinds of Sericin.

(pp. 370～376)

By Toshio NAKAHAMA and Ikuzo SAKAGUCHI.

(Kanebo Yamashina Institute; Received May 15, 1941.)

(1) It was observed that Freundlich's adsorption isotherm could always apply to the adsorption phenomena of formaldehyde on various kinds of sericin: the ordinary sericin preparation, sericin A and B.

(2) When the dilute formaldehyde solutions lower than 3% were tested, a larger amount of formaldehyde was adsorbed on sericin B compared with sericin A, while sericin A revealed more powerful adsorption with the concentrated formaldehyde solutions higher than 4%.

Functional Studies on Soil. (XVII～XIX).

(pp. 377～382)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen; Received April 12, 1941.)

Functional Studies on Soil. (XX～XXII).

(pp. 383～388)

By Hideo MISU.

(Agricultural Experiment Station, Government General of Tyosen; Received April 12, 1941.)

On the Denaturation of Sericin. (Part 4.)

Some relation of denaturation of $\alpha_{3.8}$–sericin with $\alpha_{4.4}$–sericin.

(pp. 389～393)

By Zirô HIROSE.

(Sericultural Research Laboratory of Gunze Raw Silk Mfg. Co. Ltd;
Received March 26, 1941.)

INTRODUCTION.

In the previous paper⁽¹⁾, I have reported on some relation of denaturation of

$\alpha_{3.8}$–sericin with $\alpha_{4.4}$–sericin stoichiochemically, and stated that the stoichiometric properties of denatured product of $\alpha_{3.8}$–sericin, or α_1–sericin, are more similar to those of $\alpha_{4.4}$–sericin than to the original $\alpha_{3.8}$–sericin.

In this paper I reported on the difference of distribution of nitrogen between $\alpha_{4.8}$–, and $\alpha_{4.8}$–sericin, and also on the sugar, amino sugar, and tryptophane contents of $\alpha_{4.4}$–, $\alpha_{4.2}$–, α_1–, α_2–, and $\alpha_{3.8}$–sericin and described some differences in the chemical structures among these sericins.

EXPERIMENTAL.

1. The difference of distribution of nitrogen between $\alpha_{4.8}$–, and $\alpha_{3.8}$– sericin.

a) Isoelectric point of $\alpha_{4.8}$– sericin obtained from the cocoon flock by extracting with boiling water for 10 minutes.

10 gs. of cocoon flock, being carefully freed from impurities by washing with distilled water, was extracted by boiling for 10 minutes in 3 *l* of distilled water, and the experiment was carried out in the same way as described in the previous paper(2).

(Quantity of N is expressed in mg/200 cc)

Total Nitrogen	pH / Kind of Sericin	4.6	4.8	5.0	5.2	5.4
16.03	α-sericin N.	2.03	3.08 (max)	2.45	2.38	1.05
	β-sericin N.	14.00	12.95	13.58	13.65	14.98
	β/α	—	420.5	—	—	—

Isoelectric point of α-sericin is about 4.8 in this case.

b) Preparation and isolation of $\alpha_{4.8}$–sericin from cocoon flock.

50 gs of cocoon flock, being carefully freed from impurities was extracted by boiling for 10 minutes in 10 *l* of distilled water and obtained sericin sol. To this sericin sol, added acetate mixture of pH 4.8 (0.02), and precipitate thus formed was brought to the powdered state by means of alcohol and ether.

Yield······1.72 g N %······17.47%

c) The difference in distribution of nitrogen between $\alpha_{4.8}$–sericin.

Determinations of N–distribution of sericins were carried out by van Slyke's method, after the hydrolysis of sericin with 20% HCl by boiling for 20 hours under the reflex condenser.

Kind of Sericin	Amide-N	Humine-N	Monoamino acid-N	Diaminoacid-N	Sum.
$\alpha_{4.8}$–sericin	9.08	1.27	65.28	23.29	98.92
$\alpha_{3.8}$–sericin	10.32	1.08	72.40	18.47	101.27

2. Sugar content of $\alpha_{4.4}$–, $\alpha_{4.2}$–, α_1–, and $\alpha_{3.8}$–sericin.

The method of Tillmans(3) was used for the determination of carbohydrate of sericin. Experimental result was as follows :—

Kind of Sericin	Sugar (as glucose)		Kind of Sericin	Sugar (as glucose)	
	Sugar per 100 mg of sericin (mg)	Sugar per 100 mg of sericin N		Sugar per 100 mg of sericin (mg)	Sugar per 100 mg of sericin N
$\alpha_{4.4}$–sericin	1.13	6.54	α_1–sericin	2.13	12.43
$\alpha_{4.2}$–sericin	1.82	10.69	$\alpha_{3.8}$–sericin	1.07	6.49

3. Amino sugar contents of $\alpha_{4.4}$–, $\alpha_{4.2}$–, α_1–, and $\alpha_{3.8}$–sericin. The method of Nillson⁽⁴⁾ was used for the determination of amino sugar of sericin. Experimental result was as follows :—

Kind of Sericin	Amino sugar (as glucosamine)		Kind of Sericin	Amino sugar (as glucosamine)	
	Amino sugar per 100 mg of sericin (mg)	Sugar per 100 mg of sericin N		Amino sugar per 100 mg of sericin (mg)	Sugar per 100 mg of sericin N
$\alpha_{4.4}$–sericin	1.41	8.16	α_1–sericin	2.02	11.79
$\alpha_{4.2}$–sericin	1.97	11.40	$\alpha_{3.8}$–sericin	1.13	6.86

4. Tryptophane contents of $\alpha_{4.4}$–, α_1–, $\alpha_{3.8}$–, and α_2–sericin*. The modified method of Tomiyama⁽⁵⁾ for the colorimetric determination of tryptophane contents of sericin was used. Experimental result was as follows :—

Kind of Sericin	Tryptophane contents (%)
$\alpha_{4.4}$–sericin	0.81
$\alpha_{4.2}$–sericin	0.68
α_1–sericin	0.89
$\alpha_{3.8}$–sericin	0.41
α_2–sericin *	0.31

* Note on α_2–sericin.

α_2–sericin was obtained as precipitate from the filtrate of α_1–sericin⁽²⁾, adding alcohol until the alcohol concentration reached 50 %. So this fraction is decomposition product of $\alpha_{3.8}$–sericin.

Discussion.

As to the difference of physico-chemical properties and the chemical compositions among $\alpha_{4.4}$–, $\alpha_{4.4}$–, $\alpha_{4.2}$–, and $\alpha_{3.8}$–sericin, we have already reparted.⁽¹⁾ The difference seems to have some relation to " component system theory of protein " as was already reported by Dr. Kondo and Dr. Sörensen. But here, one fact should be emphasized, that chemical composition and stoichiometric properties of $\alpha_{4.4}$–sericin are more similar to α_1–sericin than to $\alpha_{3.8}$–sericin.

Recently, Rutherford and Harries⁽⁶⁾ studied the existence of fractions of the sericin in raw silk, and concluded that sericin in raw silk does not exist as a mixture of fractions. But they did not take into account the fact that sericin dissolves during the process of raw silk manufacturing. This dissolved sericin is rich in β–sericin⁽²⁾, while, on the contrary, according to their results, the very low yield of β–sericin was obtained by the 5 minutes autoclave treatment. Therefore, we can not agree with their view in this respect.

Summary.

1. In the nitrogen distribution, diamino acid-N contents of $\alpha_{4.8}$–sericin is greater than that of $\alpha_{3.8}$–sericin.

2. Chemical composition of $\alpha_{4.4}$–, and $\alpha_{4.2}$–sericin is more similar to α_1– than to $\alpha_{3.8}$–sericin.

a) $\alpha_{4.2}$–, and α_1–sericin have more sugars and amino sugars than $\alpha_{3.8}$–sericin.

b) $\alpha_{4.4}$–, α_1–, and $\alpha_{4.2}$–sericin have more tryptophane than $\alpha_{3.8}$– sericin, and $\alpha_{4.4}$–, and α_1–sericin have more tryptophane than $\alpha_{4.2}$–sericin.

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The Colloidal Clay in Solonchak and Solenetz Soils in Manchuria.

(pp. 394~395)

By KAWASHIMA and M. NAGATA.

(Agr. Chem. Laboratory, Kyushu Imp. University; Received April 24, 1941.)

The colloidal clay below 1 μ in particle size was separated by sedimentation and analized by the fusion method.

These colloids are characterized by high SiO_2/Al_2O_3 and SiO_2/R_2O_3 ratios, the former being from 4.15 to 4.50, and the latter from 3.11 to 3.30. The base-exchange capacity determined by the NH_4-acetate method varied from 40.10 to 64.35 m.e. The higher capacity is due to some mingled humic substances.

Studies on the Value of Chemicals as Manure for *Juncus effusus* L. var. *decipiens Buch.* III.

On the Value of Some Compound Fertilizers.

(pp. 396~403)

By H. SUTOH.

(The Simane Prefectural School of Agriculture and Forestry at Masuda, Simane, Japan; Received May 6, 1941.)

In this paper the result of the investigation into the relative value of some compound fertilizers will be reported.

The compound fertilizers used in the investigation were 8 kinds, namely, Mizuho-, Mikuni-, Kozuti-, Tukasa-, Tokiwa-, Ryûsô-kwaseihiryô, Sumitomo-kwaseirin'ankarihiryô, and Dainippon-rinsankarihiryô-5-gô. Several lots of these fertilizers as well as those of controls (mixed ammonium sulphate, sodium biphosphate and potassium sulphate) besides some of no-manure were set up.

Table I. Compound fertilizers used.

Constituents. / Compound fertilizers.	N_2		P_2O_5		K_2O		Notes
	Total	Ammoniac	Total	Water soluble	Total	Water soluble	
Mizuho.	% 8.0	% 8.0	% 10.0	% 7.0	% 5.0	% 5.0	gray; granular. (a little hygroscopic)
Mikuni.	10.0	9.0	10.0	8.0	10.0	10.0	dark gray.
Kozuti.	5.0	4.0	10.0	8.0	5.0	5.0	gray; fine granule.
Tukasa.	6.0	6.0	10.0	8.0	3.0	3.0	grayish white; coarse powder; external appearance like Ca-superphosphate.
Tokiwa.	5.0		12.0		3.0		gray; granular.
Ryûsô.	5.0	5.0	12.5	10.0			gray; coarse powder.
Sumitomo-kwasei-rin'ankari-hiryô.	10.0	10.0	5.0	4.5	5.0	5.0	gray; granular.
Dainippon-rinsan-kairihiryô-5-gô.			15.0	13.0	5.0	5.0	gray; powder; external appearance like Ca-superphosphate.

The condition of growth, yield as well as the quality of the rush were investivated.

The rushes in the lots of the compound fertilizers were all observed to have grown healthier and better than those in the control lots.

The comparative yields and other data are presented in the following table.

Table II. Experimental results.

Lots. / Items.	No-Manuse.	Mizuho.	Mikuni.	Kozuti.	Tukasa.	Tokiwa.	Ryûsô.	Sumitomo-kwasei-rin'ankari.	Dainippon-rinsankari-5-gô.	Control.
Air-dried stems (weight) (total)	4	123	115	125	126	113	118	127	123	100
(over 45 cm)	0	127	128	139	140	126	125	143	139	100
(over 75 cm)	0	264	254	275	277	256	202	283	289	100
Number of stems (over 45 cm)	0	105	111	125	117	107	116	126	112	100
(over 75 cm)	0	236	236	268	239	232	183	265	254	100
(total)	12	95	95	98	97	88	93	97	86	100
Total weight.	5	120	111	116	115	107	111	121	116	100
Tillering (multiples compared to number of young plants transplanted)	3.4	26.3	26.5	27.2	26.9	24.4	25.8	27.0	24.0	27.8
(over 45 cm)	0	13.3	14.0	15.7	14.7	13.5	14.6	15.9	14.2	12.6
T/R	0.99	2.35	2.50	2.82	3.11	2.64	2.65	2.59	2.62	2.20

The comparative yield of air-dried stems was 127 in the lot of Sumitomo-kwasei-rin'ankari-hiryô, 126 in Tukasa-lot, 125 in Kozuti-lot, 123 in Mizuho-lot, 123 in Dainippon-rinsankari-hiryô-5-gô-lot, 118 in Ryûso-lot, 115 in Mikuni-lot, 113 in Tokiwa-lot, 100 in control lot (mixed chemicals) and 4 in no-manure lot. The comparative yield in long stems (over 75 cm) was 289 in the lot of Dainippon-rinsankari-hiryô-5-gô, 283 in Sumitomo-kwasei-rin'ankarihiryô-lot, 277 in Tukasa-lot, 275 in Kozuti-lot, 264 in Mizuho-lot, 256 in Tokiwa-lot, 254 in Mikuni-lot, 202 in Ryûsô-lot and 100 in control-lot. Further investigation, however, will be necessary to definitely determine the relative fertilizing value of these fertilizers so as to assign each of them a definite position according to its value as a manure for the rush.

The multiplication of tillers were found to be three times in no manure-lots and as high as 28 times the original number in the case of control lot. The increase in number of stems in the compound fertilizer lots ranged from about 24 to about 27 times the number at the start. In the stems grown over 45 cm in length the increase in number of tillers ranged from about 13 times in Mizuho-lots to about 16 times the original number in Sumitomo-kwasei-rin'ankari-lots.

So far as the present investigation goes, Sumitomo-kwasei-rin'ankari-hiryo seems to be much more effective for the growth of the rush than other compound fertilizers, Dainippon-rinsankari-hiryo-5-go being superior as the manure of phosphoric acid and potash manure for the cultivation of the rush.

The compound fertilizers above mentioned all have the so-called peculiar properties, and it is possible for this reason to regard them as adequate manures for the cultivation of the rush plant.

On the Chemical Studies of the Bagass-pulp. (2～3).

(pp. 404～410)

By Tetutarō Tadokoro and Keizō Ito.

(Hokkaido Imperial University; Received April 1, 1941.)